TECHNICAL NOTES

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Logging Damage Risk Classification for Sugar Maple[1/]

In sustained yield management the partial-cutting method is currently held to be the most desirable one for maintaining hardwood forests in continuous saw-log production and at the same time providing for improvement of log quality and log grade. However, even with care during harvesting the residual stand is subject to logging injury. Recent work at the Upper Peninsula Experimental Forest at Dukes, Mich., shows that fungi often cause extensive decay at logging wounds. Need for a guide in predicting the amount of cull that can be expected at trunk scars and broken branch stubs is evident. Based on the study discussed below, such a guide has been developed (table 1).

Table 1.--Logging damage risk classification for merchantable sugar maple in the Lake States region

Type and size class of injury	Average defect deduction for--	
	10-year-old wounds	20-year-old wounds
	Board-feet[1/]	Board-feet[1/]
Logging scars		
Smaller than 4 inches wide	No deduction	10
6 inches wide	10	20+
8 inches wide	20	35
10 inches wide	30 to cull	50 to cull
Branch stubs		
Stubs smaller than 4 inches in diameter	No deduction	No deduction
Stubs 4 inches in diameter or larger	5-8	15-20

1/ Log scale.

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1/ A cooperative research project of the Laboratory of Pathology in Forest Practice at the University of Michigan School of Natural Resources, the Lake States Forest Experiment Station, and the Forest Products Laboratory.

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Data obtained by dissecting 252 sample logs (11,370 board-feet Scribner log rule) at a sawmill provide a means of diagnosing the amount of cull at logging wounds. Defect at 263 logging scars and 128 limb stubs was measured. Scar width proved to be the most useful criterion of the amount of rot at trunk scars on merchantable sugar maple. Decay is seldom present at small logging injuries (less than 6 inches wide) and even when it does occur it seldom results in excessive cull during the first 10-year period. But more than 50 percent of the scars 8 inches wide or larger showed substantial amounts of cull, the average for 10-year-old, 8-inch-wide scars being 20 board-feet. During a 20-year period, decay-causing fungi that become established at these wounds induce even greater loss in volume.

Likewise, limb breakage by logging was determined to be highly significant in predicting the occurrence of top rot. Branch stubs 4 inches in diameter or larger caused a log scale deduction in all but 1 of the 20 maple logs dissected to measure cull traced to these injuries. It is significant, too, that rot rarely becomes established at broken limb scars less than 4 inches in diameter within 10 years or even 20 years after logging.

These facts lend themselves to the formulation of tree risk classes for predicting losses by rot attributed to logging wounds. For example, maples with trunk scars 3 or 4 inches wide may be considered satisfactory-risk trees; but trees with wide patches of bark raked from the trunk during logging may develop excessive decay and must be considered poor-risk trees. The amount of injury and its relation to cull serves as a guide for marking sugar maple in partially cut northern hardwoods.